

Abrams Tank (M1A2) System Enhancement Package (SEP)

The mission of the M1A2 System Enhancement Package (SEP) Abrams tank is to close with and destroy enemy forces using firepower, maneuver, and shock effect. The M1A2 SEP is being fielded to armor battalions and cavalry squadrons of the heavy force. SEP upgrades are intended to improve lethality, survivability, mobility, and sustainability; and to provide increased situational awareness and command and control enhancements. Specific changes include:

- The addition of two 2nd generation Forward Looking Infrared sights (FLIRs).
- An under armor auxiliary power unit to power the tank and sensor suites.
- A thermal management system to provide crew and electronics cooling.
- Increased memory and processor speeds and full color map capability.
- Force XXI Battle Command, Brigade and Below (FBCB2) Integrated Combat Command and Control (IC³) to share battle command information and situational awareness with all components of the combined arms team.

In addition to the aforementioned SEP components, additional weight reduction measures, survivability enhancements, and safety improvements applied to the M1A2 were incorporated into the configuration that underwent Live Fire Testing and Evaluation in FY01.

The M1A2 Initial Operational Test and Evaluation (IOT&E) was conducted from September to December 1993. Based on the results of the IOT&E, DOT&E determined that the M1A2 was operationally effective, but not operationally suitable or safe. DOT&E's assessment was based on poor availability and reliability of the tank, instances of uncommanded main gun and turret movement, and unintended .50 caliber machinegun fire. Follow-On Test and Evaluation (FOT&E) II in June 1996 confirmed the adequacy of the applied corrective actions, and DOT&E assessed the M1A2 as both operationally effective and suitable.

The M1A2 SEP is a further upgrade to the M1A2 tank. Operational testing conducted to date has demonstrated an improved capability of the 2nd generation FLIR over the 1st generation FLIR to detect, recognize, and identify targets at operationally relevant ranges. During FOT&E III, the M1A2 SEP demonstrated significantly better performance during night engagements than the baseline M1A2 in the number of targets hit. During day engagements, no performance difference was detected between the M1A2 SEP and the baseline M1A2.

Phase III system level live fire tests were conducted between October 2000 and July 2001. Phase III comprised three system-level live fire tests, and 14 full-up, system-level live fire tests. The tested threats included hand-held infantry weapons, mines, artillery, anti-tank guided missiles, and tank-fired munitions. In addition to performing detailed assessments of system damage following each test, most test events provided



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opportunities for representative crews and maintenance teams to exercise Battle Damage Assessment and Repair procedures to assess training and techniques. Damage assessment team meetings concluded in August 2001. Initial test reports, evaluations, and assessment briefings were disseminated in December 2001.

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TEST & EVALUATION ACTIVITY

The U.S. Army conducted the M1A2 SEP FOT&E IV in conjunction with the M2A3 Bradley Fighting Vehicle IOT&E at Fort Hood, Texas, from September to October 2000. Testing was structured to compare the operational effectiveness and suitability of the M1A2 SEP against the currently fielded M1A2. The Army conducted the test in accordance with an approved plan and DOT&E monitored the test on site and conducted an independent evaluation.

In 2002, the Army conducted several technical test events and demonstrations to evaluate fixes for FBCB2 and other unresolved issues. The results of these tests are currently being evaluated.

TEST & EVALUATION ASSESSMENT

The M1A2 SEP is operationally effective and shows an improved level of operational effectiveness in comparison to the M1A2. This improvement in operational effectiveness is attributed to the M1A2 SEP's superior capability to detect, identify, and hit targets, as well as the M1A2 SEP's improved night fighting capability as demonstrated in FOT&E III and a Detection, Acquisition, Recognition, Identification (DARI) test.

The M1A2 SEP met the specified reliability requirements and did better than the baseline M1A2s. However, there were many failures attributable to the IC³ and FBCB2. If these failures had been included in the overall reliability evaluation, the M1A2 SEP would not have met its reliability requirements. The M1A2 SEP met its availability and maintainability requirements.

IC³ was designed to meet a key system requirement for digital battle command and is the M1A2 SEP link to FBCB2. Technical testing conducted on the M1A2 SEP indicated that the system's IC³ was sufficiently mature to enter FOT&E IV and successfully demonstrated system digital C² requirements. Despite acceptable performance in developmental testing, the system performed poorly in operational testing.

The FOT&E III, FOT&E IV, and the DARI were adequate to determine the operational effectiveness and suitability of the M1A2 SEP. The Army has no plans for follow-on operational testing of the M1A2 SEP. Plans for operational testing of the engine program are unknown.